

Bogie catalogue

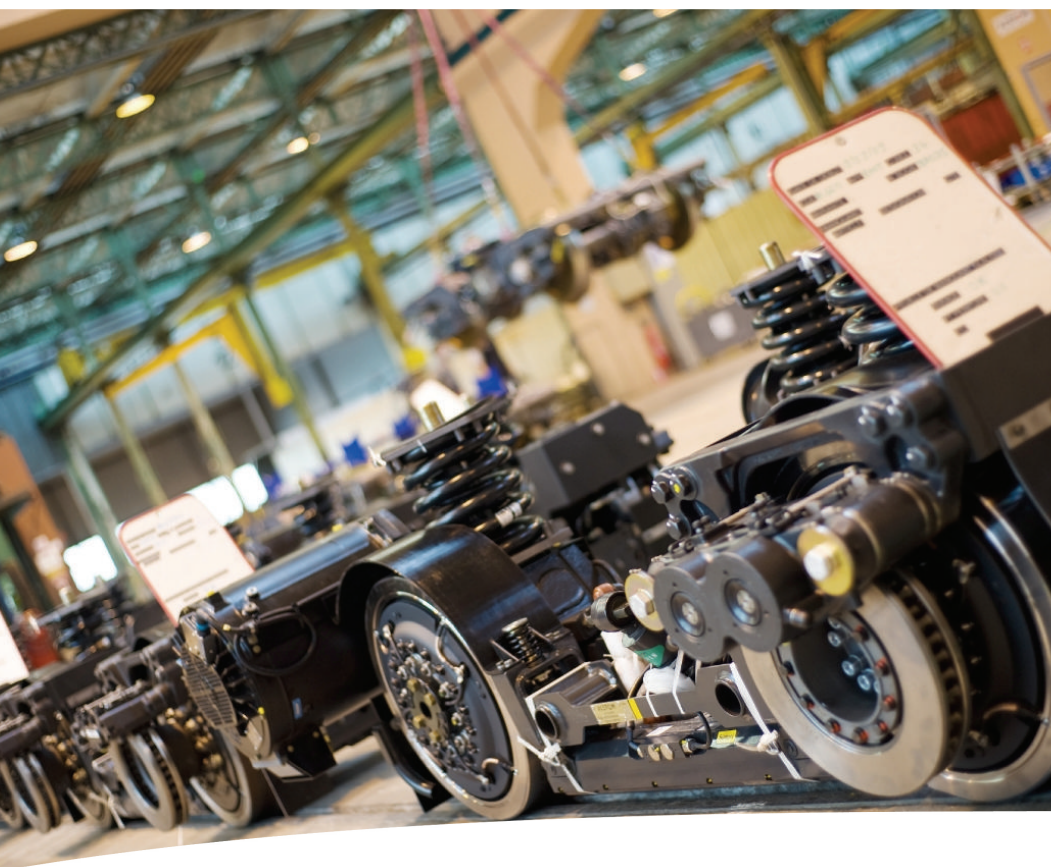
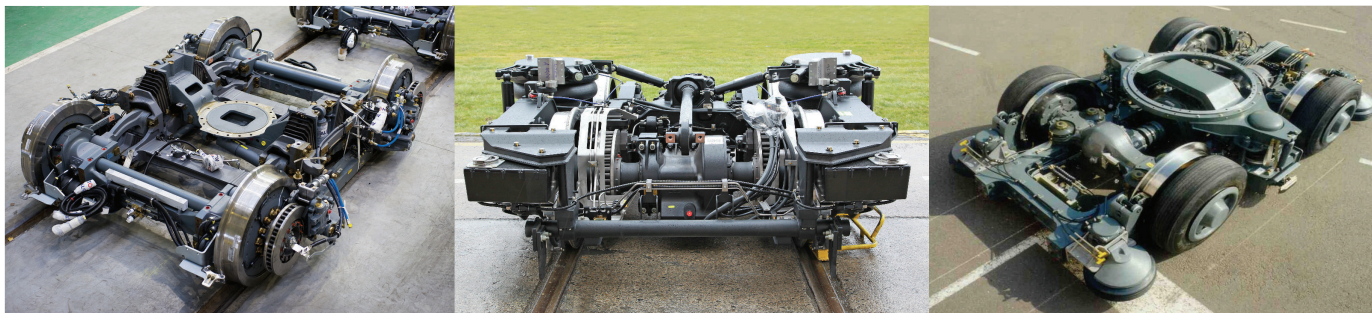


Table of contents

Introduction	03	L 140	18
Light Rail Vehicles bogies		M 160	19
Arpège	04	X 200	20
Corège	05	CL 541	21
Ipomos	06	CL 347	22
Ixège	07	Mainline bogies	
Iponam	08	CL 624	23
CL 300	09	CL 623	24
Metro bogies		CL 511	25
B 20	10	CL 334	26
B 23	11	Locomotive bogies	
B 25	12	CL 622	27
CL449	13	CL 494	28
Regional bogies		CL 587	29
CL 353	15	CL 593	30
CL 606	16	CL 465	31
CL 506	17		



A wide choice of standard and modular products



At the heart of train dynamics, the bogie is the key element in wheel-rail contact and braking/traction transmission. Alstom's bogie portfolio covers the full range of train applications from tramways up to very high-speed trains. Thanks to our extensive catalogue of modular solutions, each customer can select the appropriate bogie to meet his specific needs, such as track gauge, axle load, maximum operating speed or climatic conditions.

Each year, 3,000 bogies are manufactured and increase Alstom's proven bogie fleet in successful operation worldwide.

REDUCING OPERATOR COSTS

To reduce the total cost of ownership for operators, Alstom provides track-friendly and maintainable bogies.

Moreover, particular attention is paid to designing light equipment (for instance, Alstom tramway bogies are the lightest on the market) which is a key lever to reduce track wear and energy consumption.

MAXIMIZING PASSENGER COMFORT

Our innovative solutions contribute to have even more comfortable trains: easy access, full low-floor vehicles, vibration filtering, low noise level... Alstom bogies contribute to a pleasant travel experience for passengers. On the high-speed market, thanks to Alstom's tilting bogies, trains can travel more rapidly through curves on conventional lines (35% faster than a classic train) and up to 250 km/h on high-speed lines, while guaranteeing excellent stability and level of passenger comfort inside the train.

INNOVATIVE, SAFE & RELIABLE BOGIES

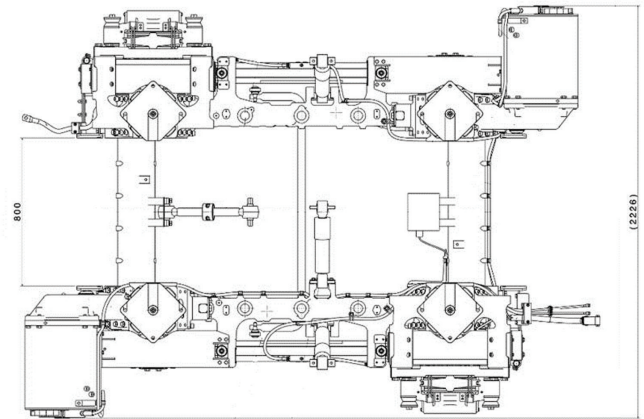
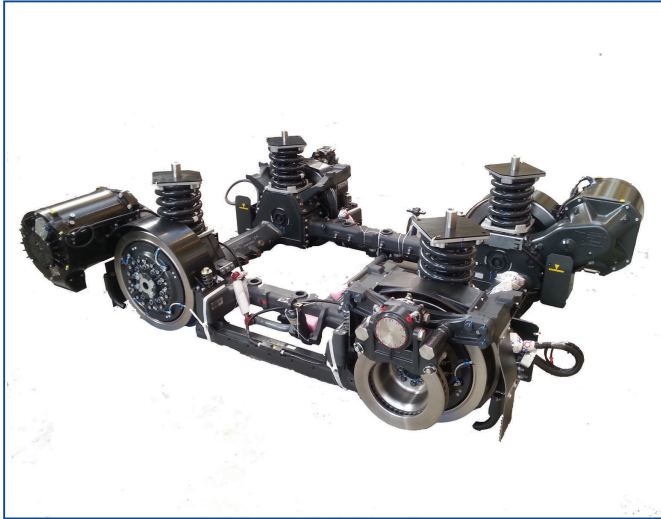
Our bogie engineering centres at Le Creusot (France) and in Salzgitter (Germany) master all sub-systems development – including the gearbox – and design state-of-the-art products. The latest illustration of this excellence in design is Iponam: this bogie equips Citadis Spirit, the only US-compliant light rail vehicle with a fully low-floor and the capacity to travel at speeds of over 100 km/h.

In addition, our complete bogie test bench, unique in Europe, ensures we are providing our customers with solutions which are not only innovative but also safe, reliable and long-lasting.

CLOSE TO OUR CUSTOMERS

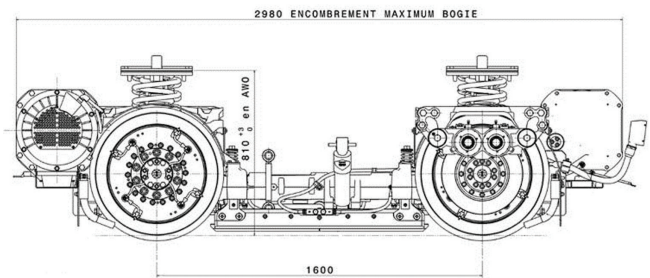
Alstom supports its customer projects via a network of manufacturing locations across the globe, while retaining a single design authority. Alstom accompanies its customers by offering a range of customised services for their trains and sub-systems – whether they are built by Alstom or not – throughout the entire lifecycle. Thanks to our catalogue of bogie spare parts and full range of maintenance and overhaul expertise, we help our customers to stay focused on their core business while minimising the lifecycle costs of their equipment.

Arpège



MAIN FEATURES

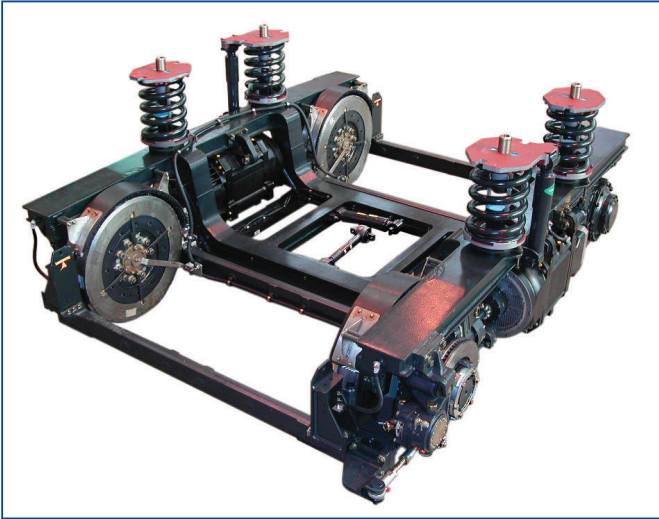
- Optimized bogie perfectly adapted to well-maintained track
- Short wheelbase = 1600 mm
- Lightest LRV bogie on the market
- Enables full flat saloon and 16 seats above bogie
- REX of more than 6000 bogies produced and operated all over the world under Citadis tramways



MAIN BOGIE CHARACTERISTICS

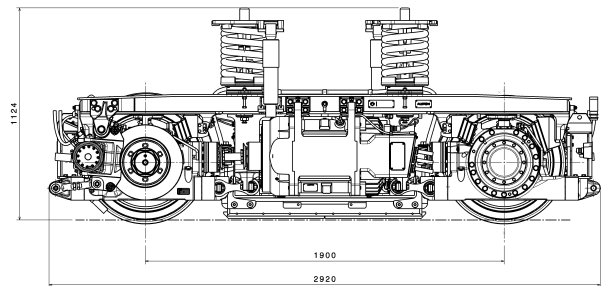
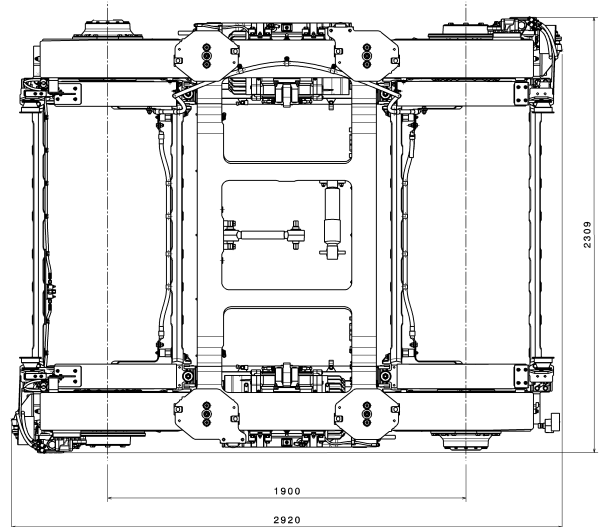
Operating speed (kph)	70
Track gauge (mm)	1435
Bogie type	Non pivoting
Max axle load (T/a)	12.5
Weight (T)	Motor bogie: 3.5 / Trailer bogie: 2.5
Type of wheel	Highly resilient
Type of primary suspension	None
Type of secondary suspension	Helicoidal springs
Carbody connection	Rods
Type of brake motor bogie	2 hydraulic brake units + magnetic track brakes
Type of brake trailer bogie	4 hydraulic brake units + magnetic track brakes
Wheel new/worn (mm)	610/530

Corège



MAIN FEATURES

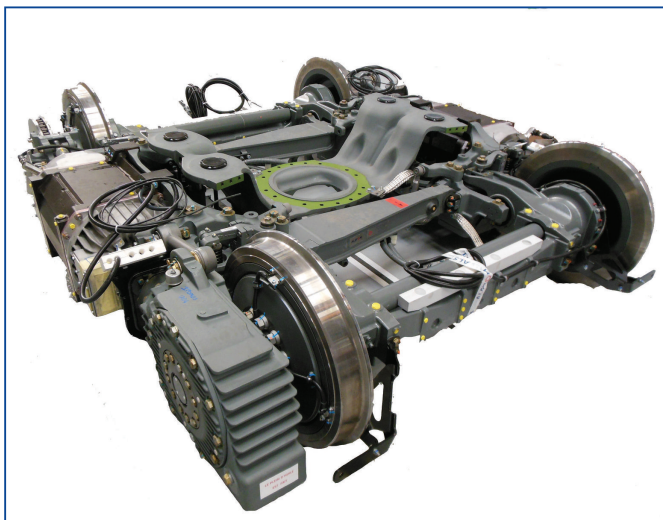
- Adapted to uneven track conditions thanks to its double-stage suspension
- Enables full flat saloon and corridor width up to 1000 mm
- High maintainability with possibility to dismount the wheels without taking down bogie
- Operated since 2004 in Rotterdam



MAIN BOGIE CHARACTERISTICS

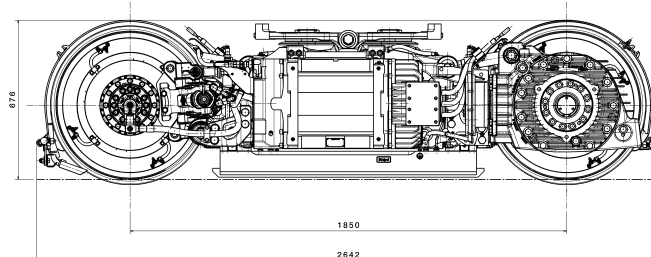
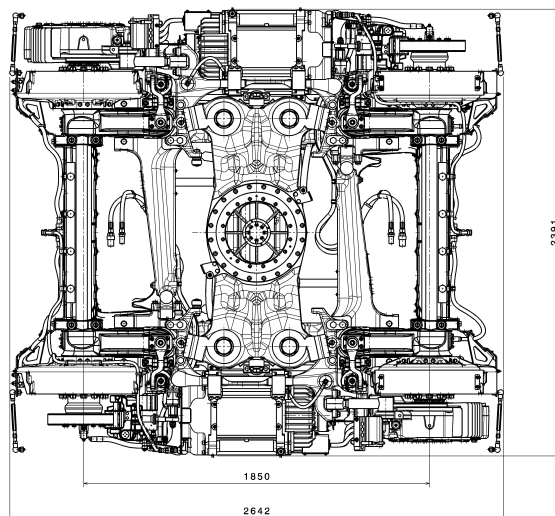
Operating speed (kph)	70
Track gauge (mm)	1435
Bogie type	Non-pivoting
Max axle load (T/a)	11
Weight (T)	Motor bogie : 4.2 / Trailer bogie : 3.1
Type of wheel	Resilient
Type of primary suspension	Rubber chevrons
Type of secondary suspension	Helicoidal springs
Carbody connection	Rods
Type of brake motor bogie	2 hydraulic brake units + magnetic track brakes
Type of brake trailer bogie	2 or 4 hydraulic brakes units + magnetic track brakes
Wheel new/worn (mm)	610/530

Ipomos



MAIN FEATURES

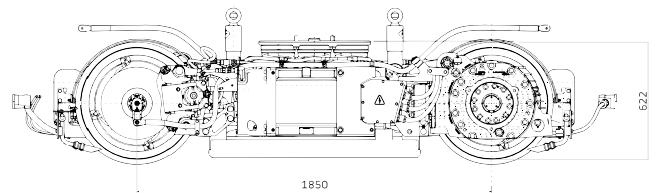
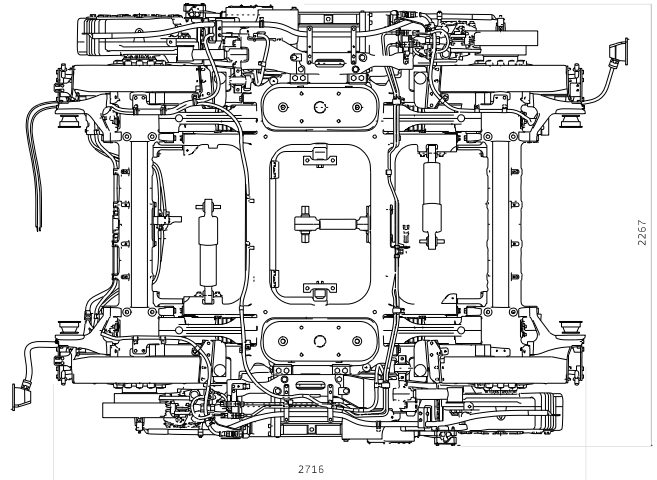
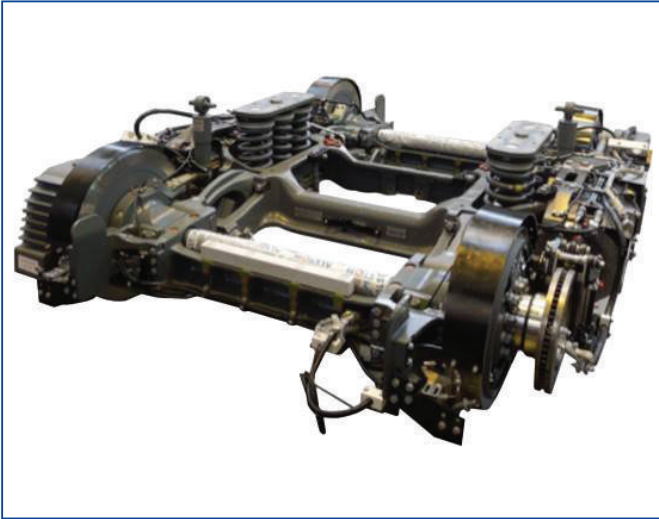
- Best-in-class on 1520 market regarding passenger comfort and movement
 - Up to 16 seats above the bogie
 - With corridor width = 590 mm
 - Podium height < 200 mm
- Adapted to uneven track conditions thanks to its articulated frame
- Winterized (-40°C)
- Operated in Moscow and Saint-Petersburg



MAIN BOGIE CHARACTERISTICS

Operating speed (kph)	70
Track gauge (mm)	1520
Bogie type	Motor bogie : pivoting / Trailer bogie : non pivoting
Max axle load (T/a)	11
Weight (T)	Motor bogie : 4.6 / Trailer bogie : 2.9
Type of wheel	Resilient
Type of primary suspension	Helicoidal springs
Type of secondary suspension	Helicoidal springs
Carbody connection	Bolster equipped with a slewing ring
Type of brake motor bogie	2 hydraulic brake units + magnetic track brakes
Type of brake trailer bogie	2 hydraulic brake units + magnetic track brakes
Wheel new/worn (mm)	630/560

Ixège



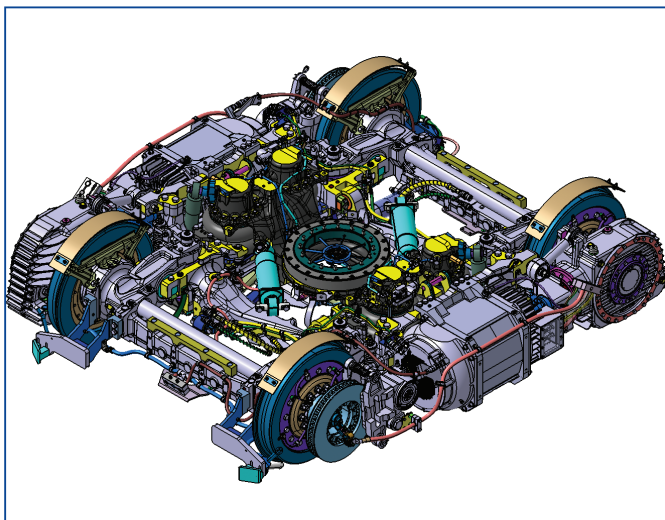
MAIN FEATURES

- Adapted to uneven track conditions thanks to its double-stage suspension
- Enables 16 seats above bogie
- Operated under tram-train Citadis Dualis by SNCF (FR) and under tram Citadis in Aubagne (FR) and Istanbul (TR)

MAIN BOGIE CHARACTERISTICS

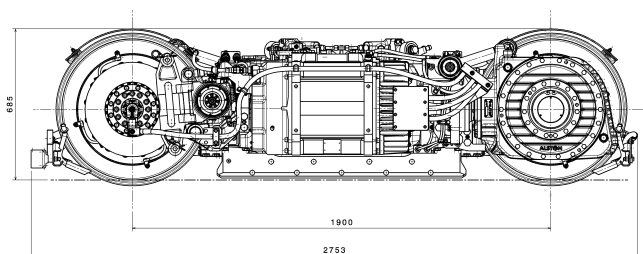
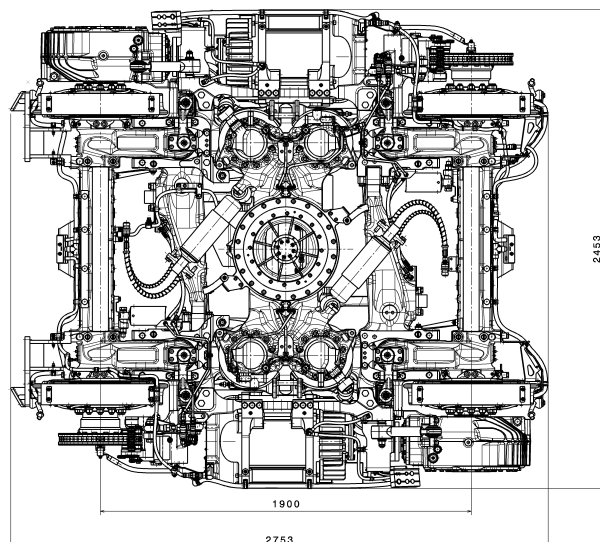
Operating speed (kph)	80 to 100
Track gauge (mm)	1435
Bogie type	Motor bogie : non pivoting or pivoting Trailer bogie : non pivoting
Max axle load (T/a)	13
Weight (T)	Motor bogie : 4.2 / Trailer bogie : 3.1
Type of wheel	Resilient
Type of primary suspension	Rubber
Type of secondary suspension	Helicoidal springs or rubber
Carbody connection	Rods or bolster with slewing ring
Type of brake motor bogie	2 hydraulic brake units + magnetic track brakes
Type of brake trailer bogie	2 or 4 hydraulic brakes units + magnetic track brakes
Wheel new/worn (mm)	Tram : 590/510 (option at 610/510) Tram-train : 640/580

Iponam



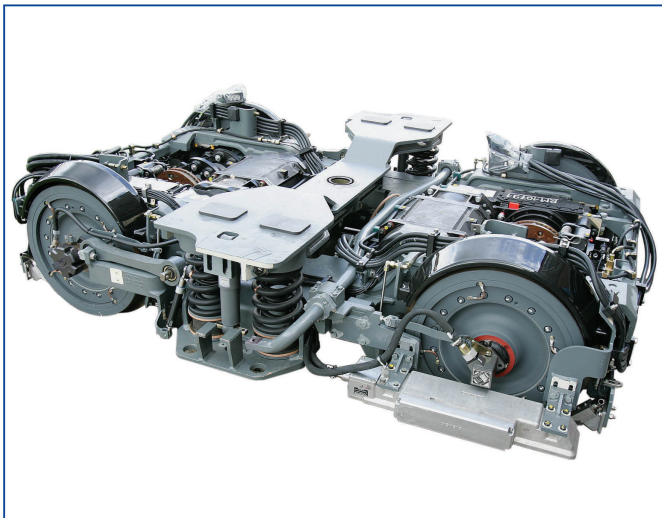
MAIN FEATURES

- Highly performant bogie compatible with US regulations (ADA)
 - 100% low-floor
 - levelling system
- Up to 16 seats above bogie
- Adapted to uneven track conditions thanks to its articulated frame
- Winterized (-40°C)
- Operation to be started in Ottawa (CA) in 2018

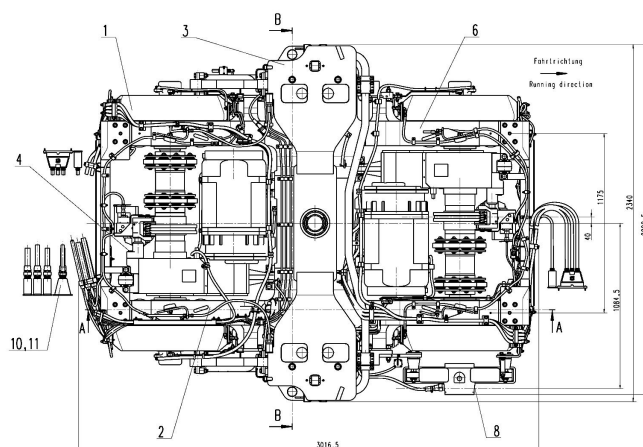
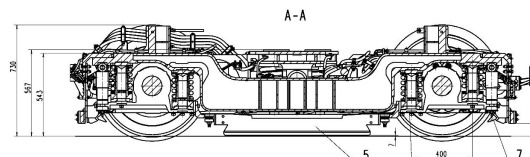
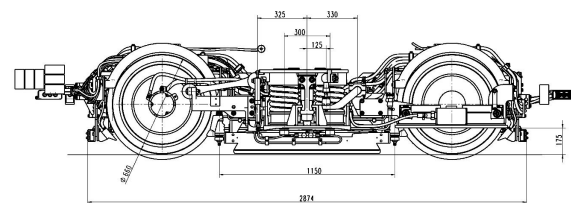


MAIN BOGIE CHARACTERISTICS

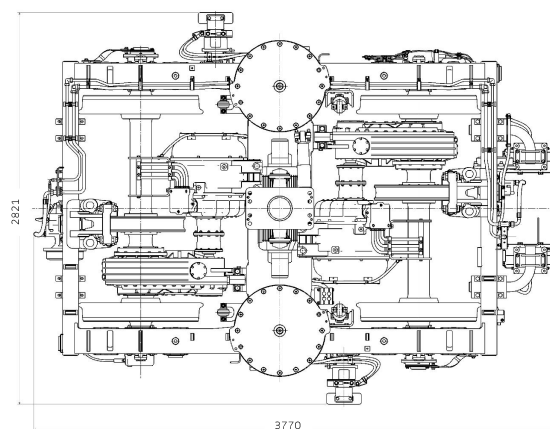
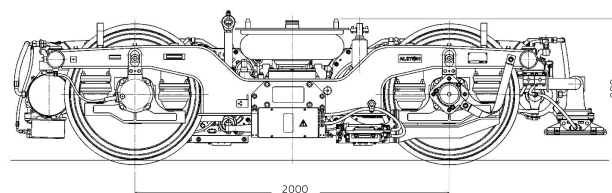
Operating speed (kph)	100
Track gauge (mm)	1435
Bogie type	Motor bogie : pivoting / Trailer bogie : pivoting or non pivoting
Max axle load (T/a)	13
Weight (T)	Motor bogie : 5.3 / Trailer bogie: 3.8
Type of wheel	Resilient
Type of primary suspension	Helicoidal spring
Type of secondary suspension	Pneumatic
Carbody connection	Bolster equipped with a slewing ring
Type of brake motor bogie	2 hydraulic brake units + magnetic track brakes
Type of brake trailer bogie	4 hydraulic brake units + magnetic track brakes
Wheel new/worn (mm)	640/570

CL 300**MAIN FEATURES**

- Tram-train bogie compliant with BoStrab
- Fully suspended gearbox
- 400 bogies operated under RegioCitadis tram-train on RandstadRail (NL) and Kassel (DE)

**MAIN BOGIE CHARACTERISTICS**

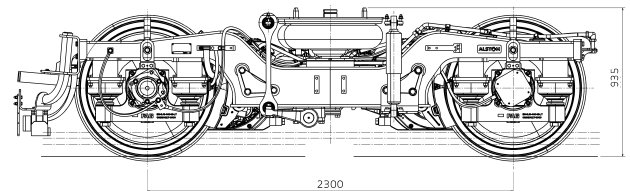
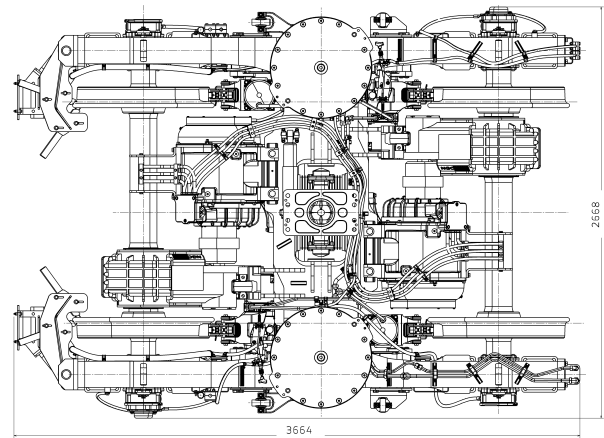
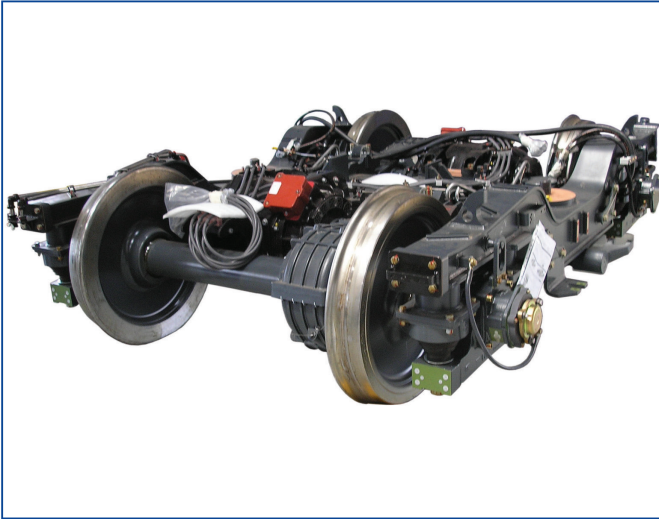
Operating speed (kph)	100
Track gauge (mm)	1435
Bogie type	Motor bogie : pivoting / Trailer bogie : pivoting
Max axle load (T/a)	11
Weight (T)	Motor bogie : 5.6 / Trailer bogie : 4.2
Type of wheel	Resilient
Type of primary suspension	Helicoidal spring
Type of secondary suspension	Helicoidal spring
Carbody connection	Bolster
Type of brake motor bogie	2 hydraulic brake units + magnetic track brakes
Type of brake trailer bogie	4 hydraulic brake units + magnetic track brakes
Wheel new/worn (mm)	660/580

B 20**MAIN FEATURES**

- Short wheelbase (2000 mm)
- Nearly 4000 bogies manufactured and operated all over the world : Amsterdam (NL), Los Teques (VE), Santo Domingo (DO), Lima (PE), etc.

MAIN BOGIE CHARACTERISTICS

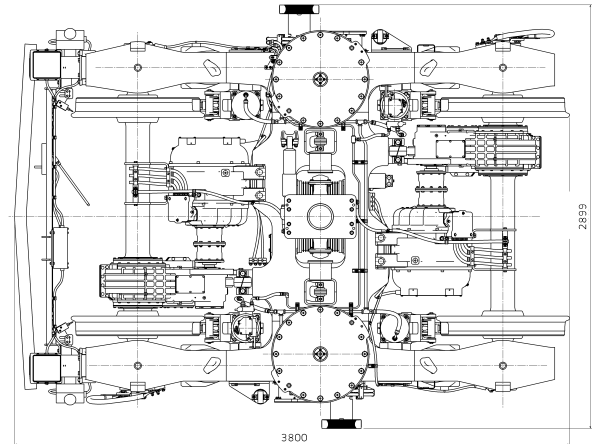
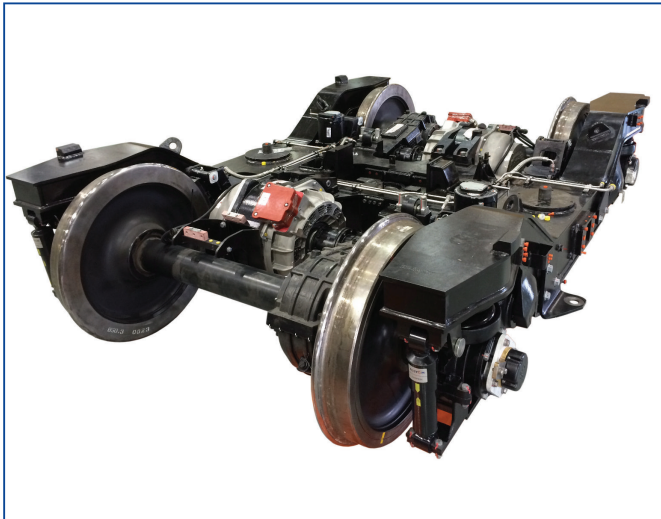
Operating speed (kph)	80
Track gauge (mm)	1435
Minimum curve radius in depot (m)	80 (25 with crown bearing)
Max axle load (T/a)	14.5
Weight (T)	Motor bogie : 6.7/ Trailer bogie : 4.85
Type of wheel	Steel
Type of primary suspension	Rubber spring
Type of secondary suspension	Pneumatic spring
Carbody connection	Pivot (option with bolster and crown bearing)
Type of brake motor bogie	2 axle-mounted disc brake units
Type of brake trailer bogie	2 (or 4) axle-mounted disc brake units
Wheel new/worn (mm)	840/770 with options

B 23**MAIN FEATURES**

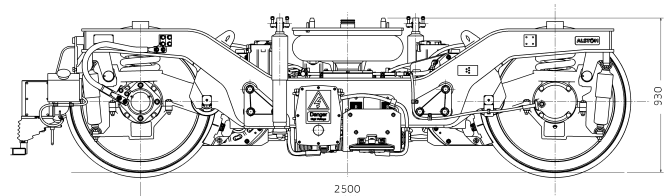
- B23 metro bogie range is covering a spectrum of application from 80 to 120 kph
 - Wheelbase = 2300 m
 - Up to 17t/axle
 - Brake configuration modular depending on speed
- Sold to CPTM and Supervia (BR), Chennai and Kochi cities (IN), Riyadh city (SA)

MAIN BOGIE CHARACTERISTICS

Operating speed (kph)	80 to 120
Track gauge (mm)	1435 or 1600
Minimum curve radius in depot (m)	80
Max axle load (T/a)	From 14.5 to 17
Weight (T)	Motor bogie : from 6.5 to 8.5 / Trailer bogie : from 4.5 to 6.1
Type of wheel	Steel
Type of primary suspension	Rubber spring
Type of secondary suspension	Pneumatic spring
Carbody connection	Pivot
Type of brake motor bogie	4 tread brake units (TBUs) or 4 wheel-mounted discs (WMDs)
Type of brake trailer bogie	4 TBUs or 2 axle-mounted discs + 4 TBUs or 4 WMDs
Wheel new/worn (mm)	840/770 to 914/834 with options

B 25**MAIN FEATURES**

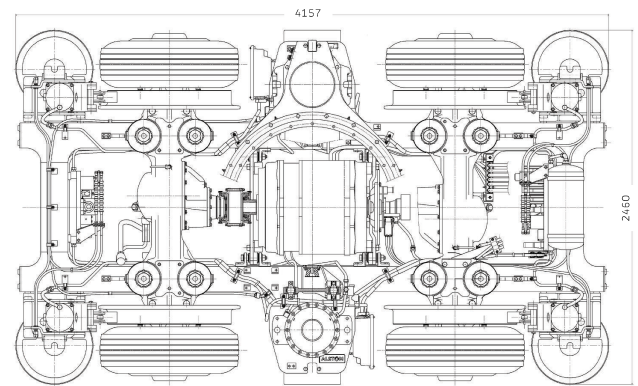
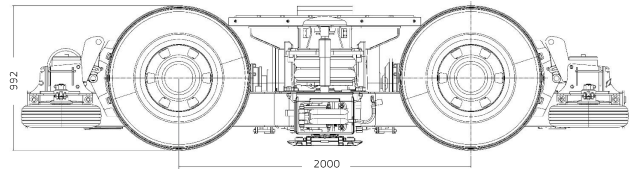
- B25 is adapted to heavy metro thanks to its 2500 mm wheelbase and 16T axle load
- Successfully operated for 10 years in China (Nanjing L1 & L2, Shanghai L10...) and Singapore (NEL, Circle Line)

**MAIN BOGIE CHARACTERISTICS**

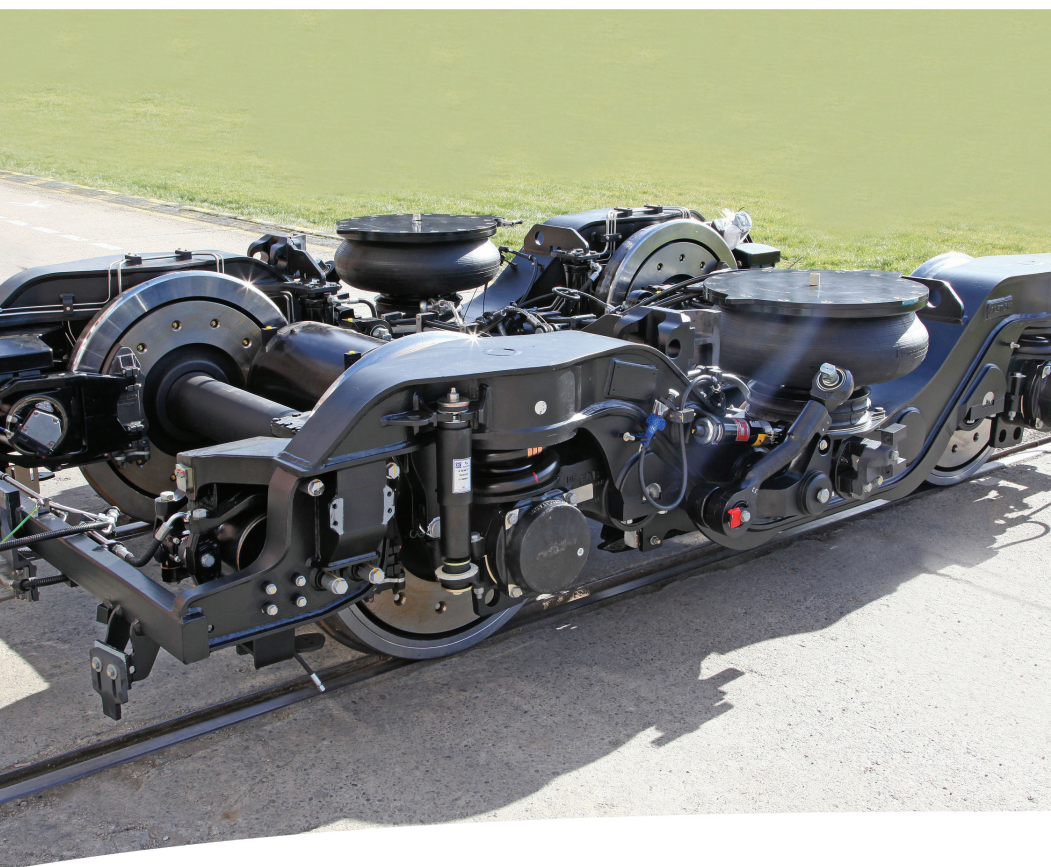
Operating speed (kph)	90
Track gauge (mm)	1435
Minimum curve radius in depot (m)	120
Max axle load (T/a)	16
Weight (T)	Motor bogie : 7.2 / Trailer bogie : 5.1
Type of wheel	Steel
Type of primary suspension	Swing arm with helicoidal spring
Type of secondary suspension	Pneumatic spring
Carbody connection	Pivot
Type of brake motor bogie	4 tread brake units
Type of brake trailer bogie	4 tread brake units
Wheel new/worn (mm)	850/775 with options

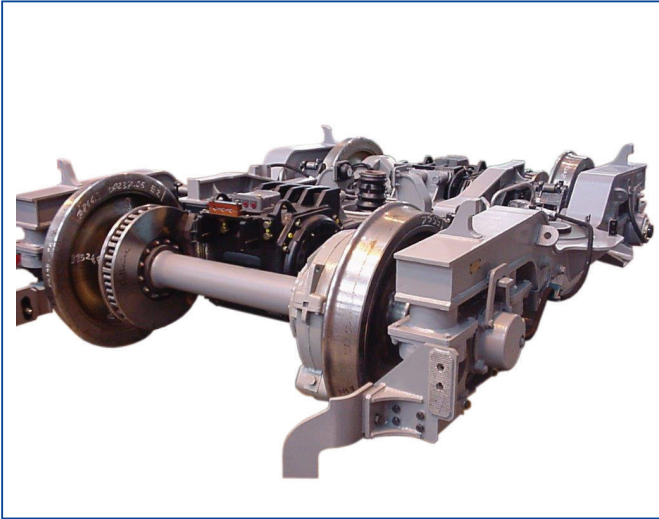
CL 449**MAIN FEATURES**

- Mono-motor bogie
- Operated by RATP since 1998 in Paris (FR) and Santiago (CL)
- Adapted version operated in Montréal (CA)

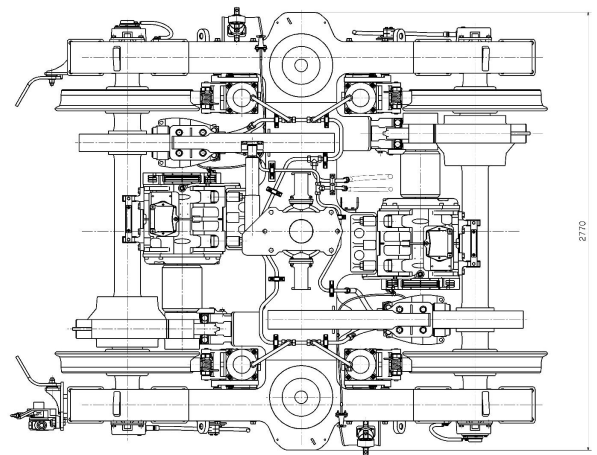
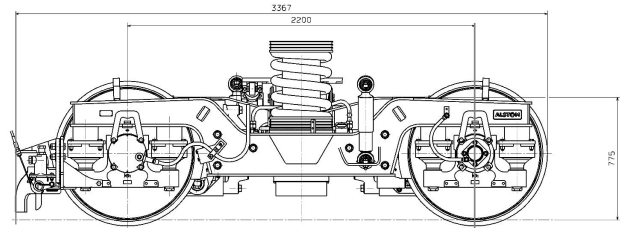
**MAIN BOGIE CHARACTERISTICS**

Operating speed (kph)	80
Track gauge (mm)	1435
Minimum curve radius in depot (m)	30
Max axle load (T/a)	12
Weight (T)	Motor bogie : 6.6 / Trailer bogie : 4.5
Type of wheel	Rubber-tyre
Type of primary suspension	Rubber spring
Type of secondary suspension	Pneumatic spring
Carbody connection	Bolster and crown bearing
Type of brake motor bogie	4 tread brake units
Type of brake trailer bogie	4 tread brake units
Wheel new/worn (mm)	-

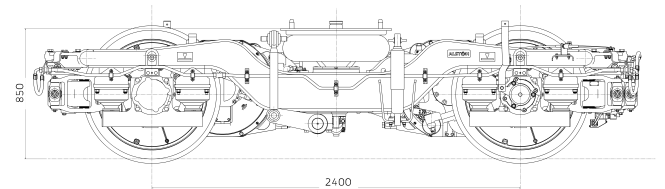
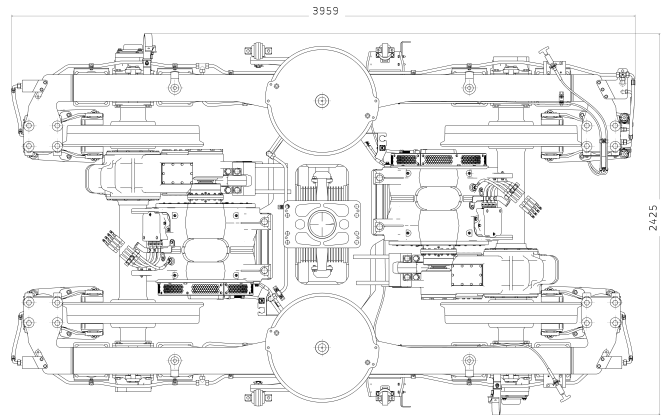
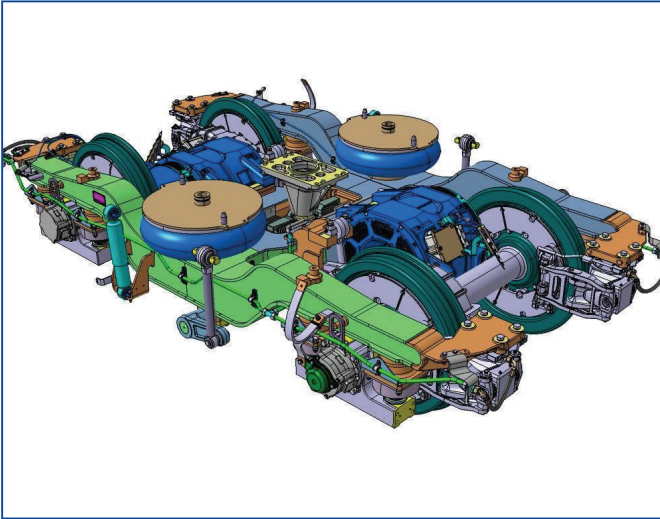


CL 353**MAIN FEATURES**

- Optimized bogies for single-deck suburban application in 1600mm track-gauge
- 900 bogies operated under X'Trapolis EMU in Chile and Australia

**MAIN BOGIE CHARACTERISTICS**

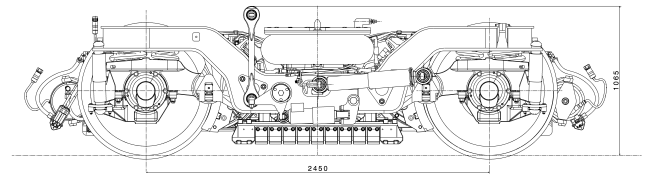
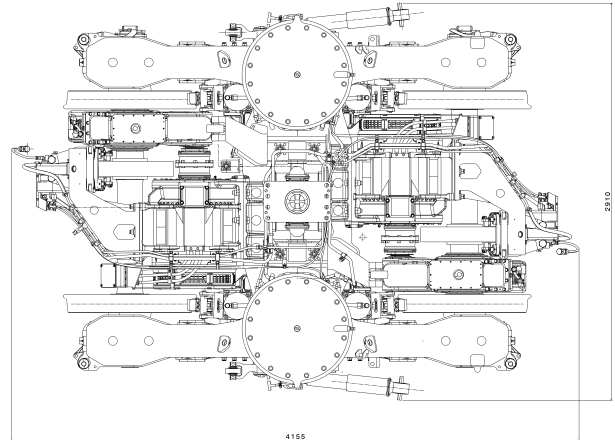
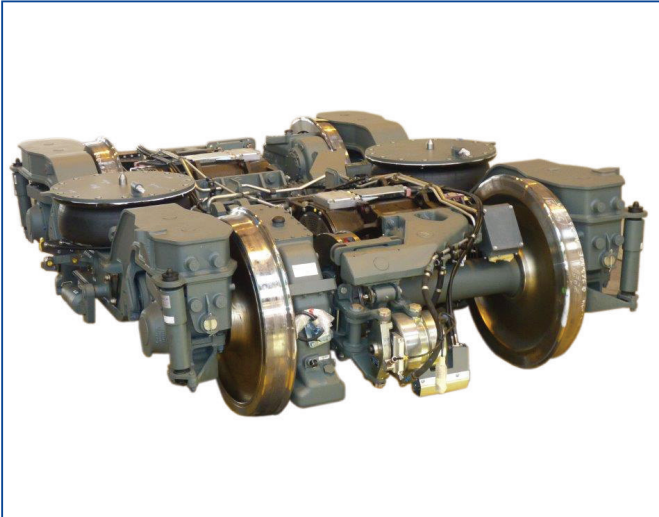
Operating speed (kph)	130
Track gauge (mm)	1670
Bogie type	Conventional
Max axle load (T/a)	16
Weight (T)	Motor bogie : 8 / Trailer bogie : 5.5
Winterized (Yes/No)	No
Type of primary suspension	Bonded rubber/metal taper springs
Type of secondary suspension	Coil springs
Carbody connection	« T » type pivot
Type of brake motor bogie	2 axle-mounted discs + 4 tread brake units
Type of brake trailer bogie	4 tread brake units
Wheel new/worn (mm)	890/820

CL 606**MAIN FEATURES**

- Optimized bogie for single-deck suburban application in metric gauge
- 7200 bogies to be manufactured and fitted under X'Trapolis Mega EMU for Passenger Rail Agency of South Africa between 2015 and 2025

MAIN BOGIE CHARACTERISTICS

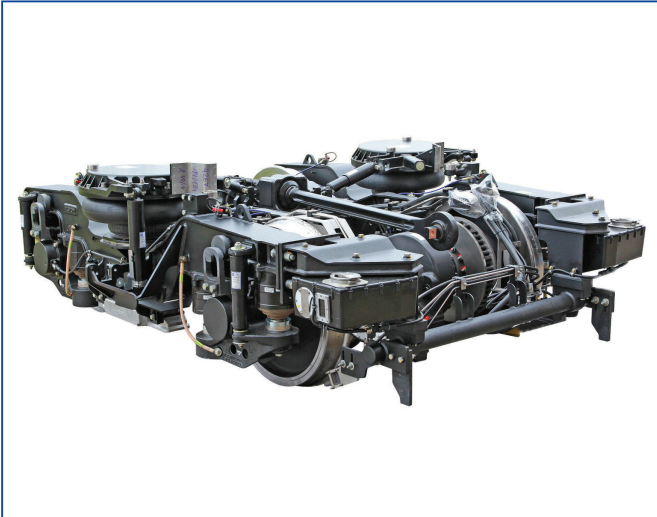
Operating speed (kph)	120
Track gauge (mm)	1067
Bogie type	Conventional
Max axle load (T/a)	17
Weight (T)	Motor bogie : 7.8 / Trailer bogie : 5.2
Winterized (Yes/No)	No
Type of primary suspension	Bonded rubber/metal taper springs
Type of secondary suspension	Airsprings
Carbody connection	« T » type pivot
Type of brake motor bogie	4 wheel-mounted discs
Type of brake trailer bogie	4 wheel-mounted discs
Wheel new/worn (mm)	840/770

CL 506**MAIN FEATURES**

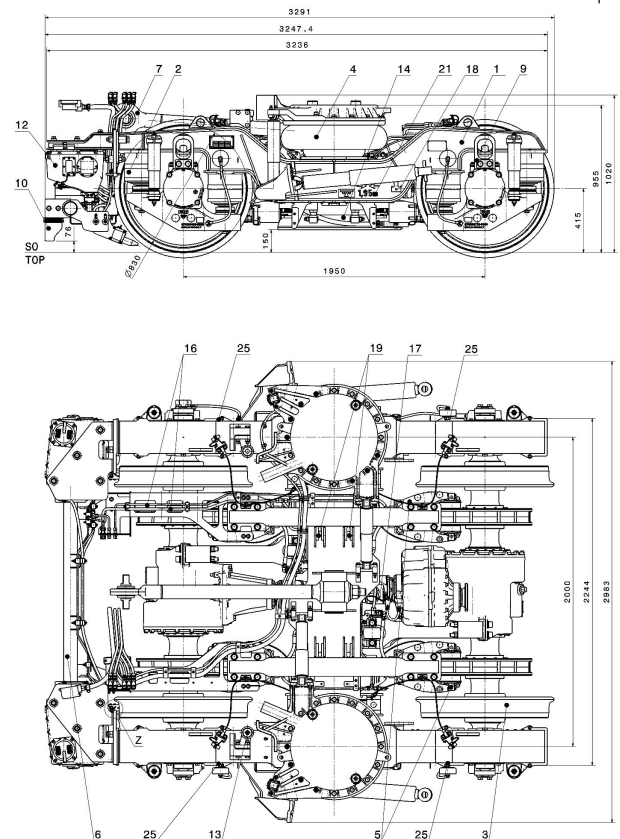
- Very compact bogie suitable for suburban double-deck EMU in 1435mm track gauge
- 2000 bogies operated by RATP and SNCF on RER Line A (FR)

MAIN BOGIE CHARACTERISTICS

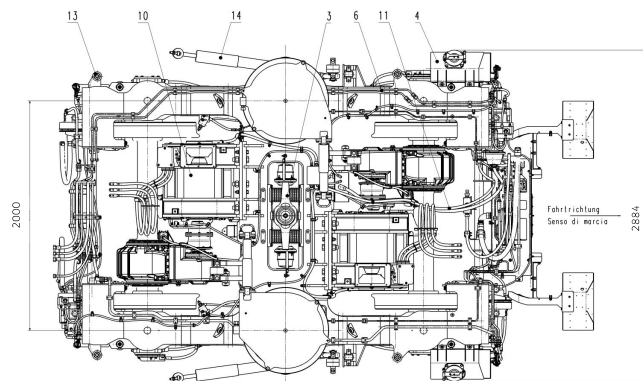
Operating speed (kph)	140
Track gauge (mm)	1435
Bogie type	Conventional
Max axle load (T/a)	22
Weight (T)	Motor bogie : 12.1 / Trailer bogie : 8.8
Winterized (Yes/No)	No
Type of primary suspension	Coil spring and swing arm
Type of secondary suspension	Airsprings
Carbody connection	« T » type pivot
Type of brake motor bogie	2 axle mounted discs + 4 tread brake units + magnetic track brakes
Type of brake trailer bogie	2 axle mounted discs + 4 tread brake units + magnetic track brakes
Wheel new/worn (mm)	Motor bogie : 920/850 / Trailer bogie : 840/770

L 140**MAIN FEATURES**

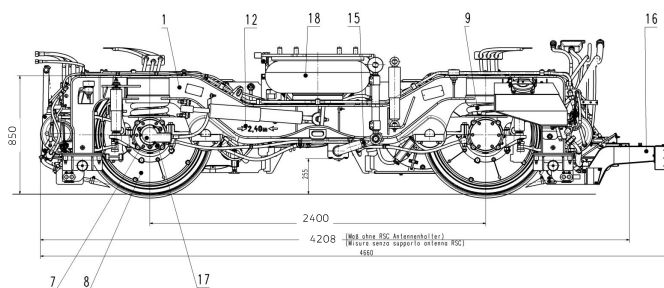
- Motor suspended under carbody
- Nearly 1000 bogies operated under Coradia Lint DMU by 14 operators

**MAIN BOGIE CHARACTERISTICS**

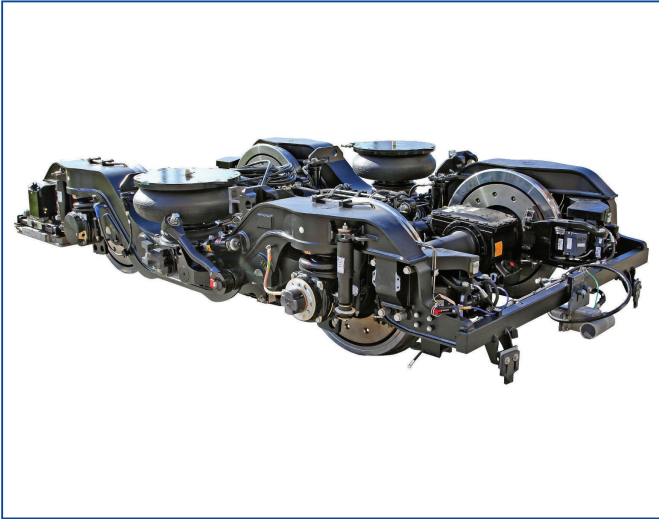
Operating speed (kph)	140
Track gauge (mm)	1435
Bogie type	Motor bogie : conventional Trailer bogie : conventional or Jacob
Max axle load (T/a)	18
Weight (T)	Motor bogie : 7.7 / Trailer bogie : 5.3 or 6.5
Winterized (Yes/No)	No
Type of primary suspension	Composite steel rubber spring
Type of secondary suspension	Airsprings
Carbody connection	Traction bar
Type of brake motor bogie	4 axle-mounted discs + magnetic track brakes
Type of brake trailer bogie	4 axle-mounted discs + on conventional bogie only: magnetic track brakes
Wheel new/worn (mm)	830/770

M 160**MAIN FEATURES**

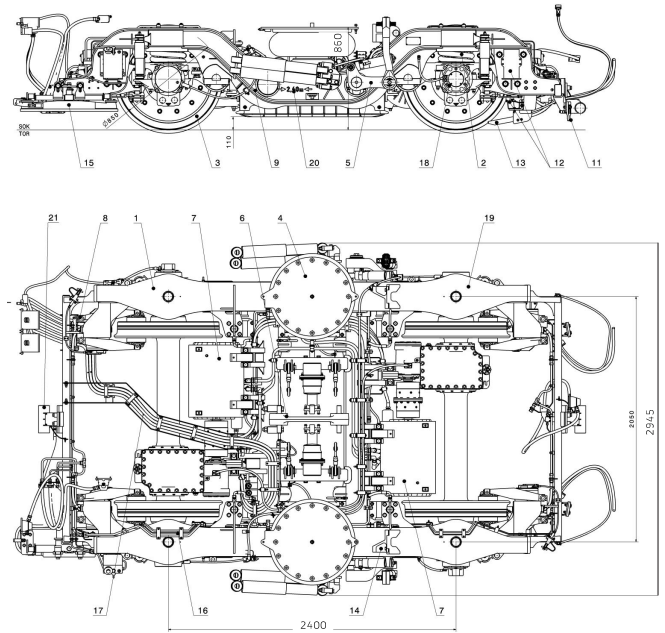
- Enables low-floor train with entrance height at 600 mm
- More than 1200 bogies operated under Coradia Meridian by Trenitalia and other Italian rail operators

**MAIN BOGIE CHARACTERISTICS**

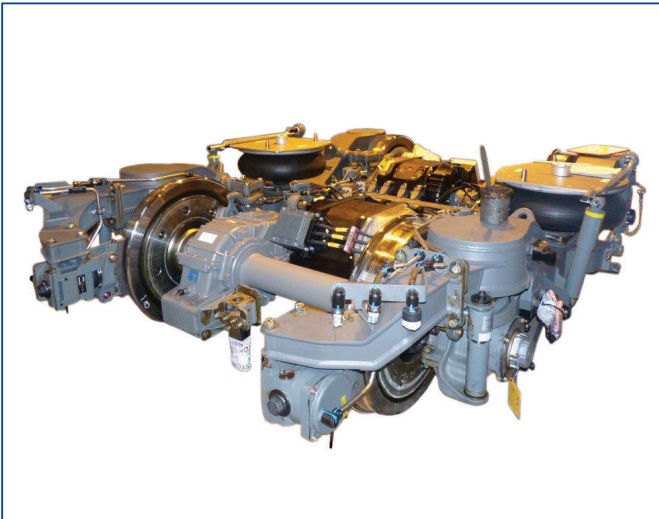
Operating speed (kph)	160
Track gauge (mm)	1435
Bogie type	Motor bogie : conventional / Trailer bogie : Jacob
Max axle load (T/a)	16/17.2
Weight (T)	Motor bogie : 9.5/ Trailer bogie : 6.3
Winterized (Yes/No)	No
Type of primary suspension	Coil spring and swing arm
Type of secondary suspension	Airsprings
Carbody connection	Motor bogie : pivot / Trailer bogie : rod
Type of brake motor bogie	4 wheel-mounted discs (+ magnetic track brakes in option)
Type of brake trailer bogie	4 wheel-mounted discs (+ magnetic track brakes in option)
Wheel new/worn (mm)	850/790

X 200**MAIN FEATURES**

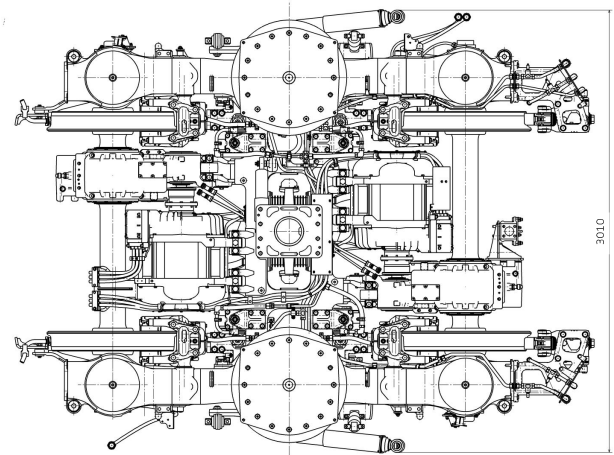
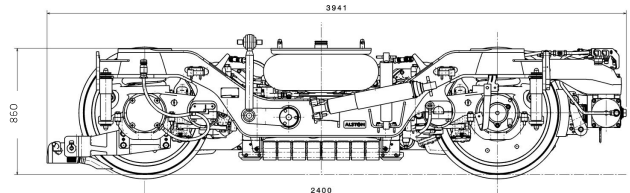
- Designed to address German and North European operating conditions with speed up to 200 kph and cold climates
- High capacity
- Enables full low-floor vehicles
- Nearly 2000 bogies operated under Coradia Continental in Germany and Coradia Nordic in Sweden

**MAIN BOGIE CHARACTERISTICS**

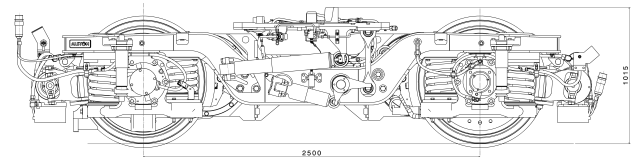
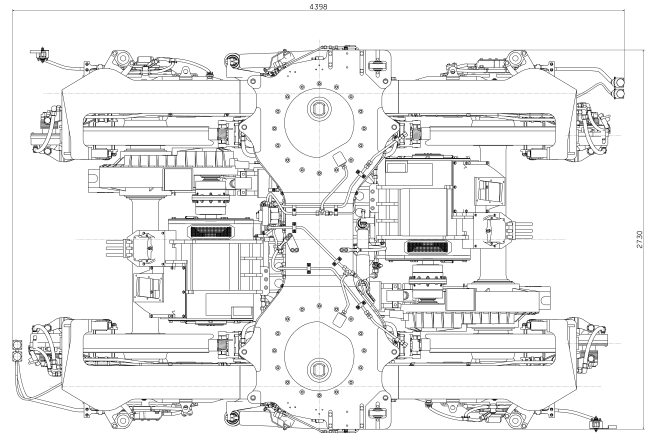
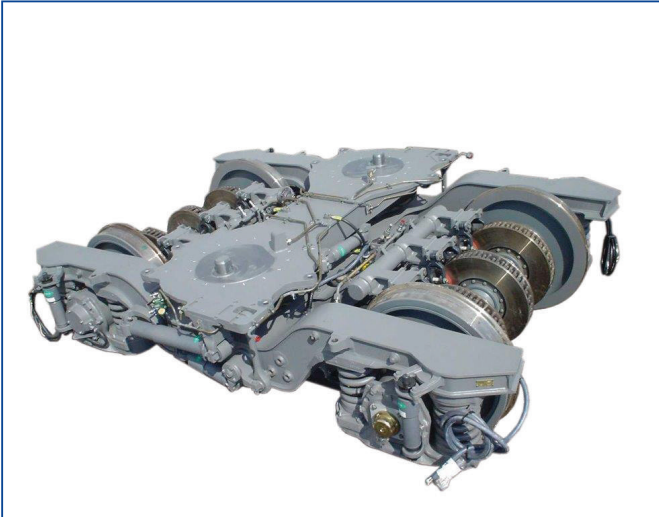
Operating speed (kph)	160 to 200
Track gauge (mm)	1435
Bogie type	Motor bogie : conventional or Jacob / Trailer bogie : Jacob
Max axle load (T/a)	20.5
Weight (T)	Motor bogie : 8.9 or 8.7 / Trailer bogie : 6.6
Winterized (Yes/No)	Yes in option
Type of primary suspension	Coil spring and swing arm
Type of secondary suspension	Airsprings
Carbody connection	Rod
Type of brake motor bogie	4 wheel-mounted discs + on end motor bogie only: magnetic track brakes
Type of brake trailer bogie	4 wheel-mounted discs + magnetic track brakes
Wheel new/worn (mm)	850/780

CL 541**MAIN FEATURES**

- Latest generation of regional bogie:
 - Benefit from optimized traction equipment thanks to permanent magnet motor
 - Enables flat floor throughout the train with entrance height at 600 mm at all entrances
- 1200 bogies operated under Coradia Polyvalent by SNCF (FR) since 2014

**MAIN BOGIE CHARACTERISTICS**

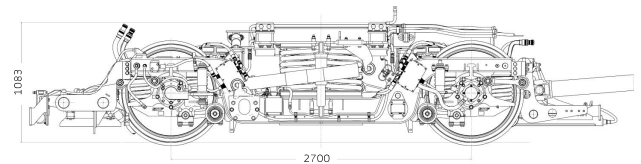
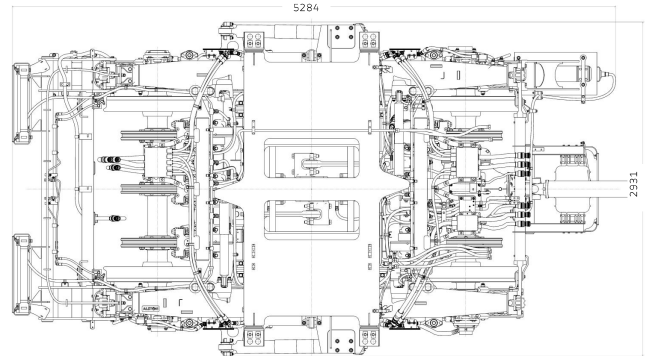
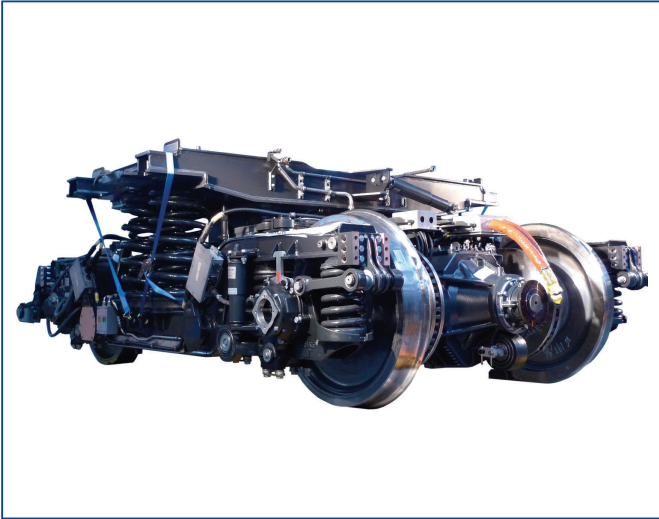
Operating speed (kph)	160 to 200
Track gauge (mm)	1435
Bogie type	End motor bogie : conventional / Trailer bogie : Jacob
Max axle load (T/a)	18.5/20
Weight (T)	Motor bogie : 9.2 / Trailer bogie : 5.9
Winterized (Yes/No)	No
Type of primary suspension	Coil spring and swing arm
Type of secondary suspension	Airsprings
Carbody connection	Motor bogie : pivot Trailer bogie : rod
Type of brake motor bogie	4 axle-mounted discs (+ magnetic track brakes in option)
Type of brake trailer bogie	4 axle-mounted discs (+ magnetic track brakes in option)
Wheel new/worn (mm)	840/770

CL 347**MAIN FEATURES**

- Highly performant bogie suitable for low-floor double-deck EMU at 200 kph
- Winterized (-40°C)
- Plug-and-play bolster for easy maintenance
- Operated under Coradia Duplex by SNCF (FR) and X40 trains by SJ (SE)

MAIN BOGIE CHARACTERISTICS

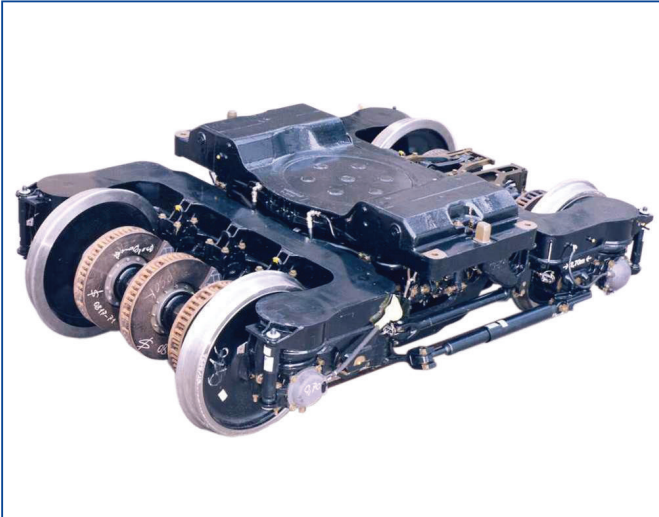
Operating speed (kph)	200
Track gauge (mm)	1435
Bogie type	Conventional
Max axle load (T/a)	22.5
Weight (T)	Motor bogie : 12.5 / Trailer bogie : 9.4
Winterized (Yes/No)	Yes
Type of primary suspension	Specific with coil spring / rubber seats ("Boite Bottin")
Type of secondary suspension	Airsprings
Carbody connection	Bolster
Type of brake motor bogie	4 wheel-mounted discs + 4 tread brake units + magnetic track brakes
Type of brake trailer bogie	6 axle-mounted discs
Wheel new/worn (mm)	920/850

CL 624**MAIN FEATURES**

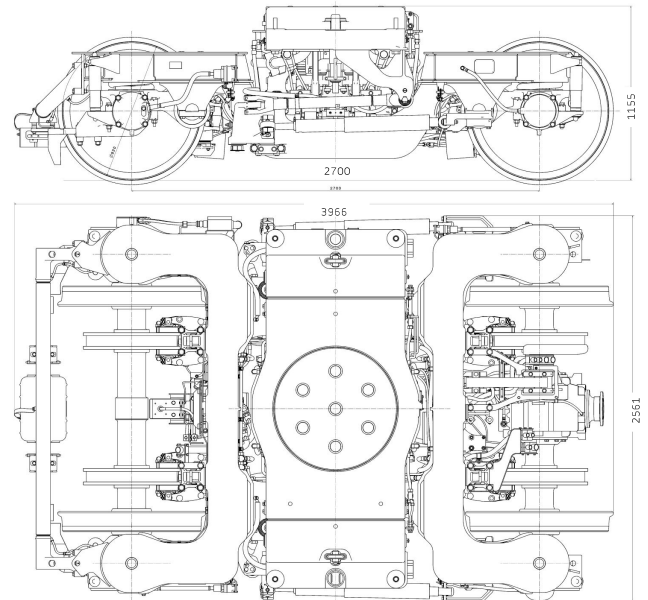
- Motor suspended under carbody
- Active hydraulic tilting system ($\pm 8^\circ$) which enables the train to reach high speed in curves on conventional lines
- Options : non-tilting, 1520 mm-track gauge, winterization
- Plug-and-play bolster for easy maintenance
- Operated by Trenitalia (IT), SBB (CH), VR (FI), PKP (PL), RENFE (ES), MOR (CN)

MAIN BOGIE CHARACTERISTICS

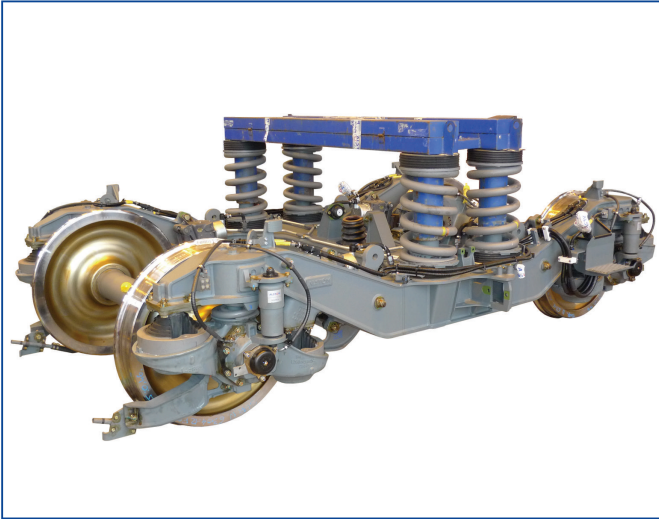
Operating speed (kph)	220-250
Track gauge (mm)	1435 with option for 1520
Bogie type	Conventional
Max axle load (T/a)	17
Weight (T)	Motor bogie : 9.2 / Trailer bogie : 8.8
Tilting (Yes/No)	Yes with option for non-tilting
Type of primary suspension	2 coil spring groups
Type of secondary suspension	Helicoidal spring or pneumatic springs
Carbody connection	Bolster and Z link
Type of brake motor bogie	5 ventilated axle-mounted discs
Type of brake trailer bogie	6 ventilated axle-mounted discs
Wheel new/worn (mm)	890/830

CL 623**MAIN FEATURES**

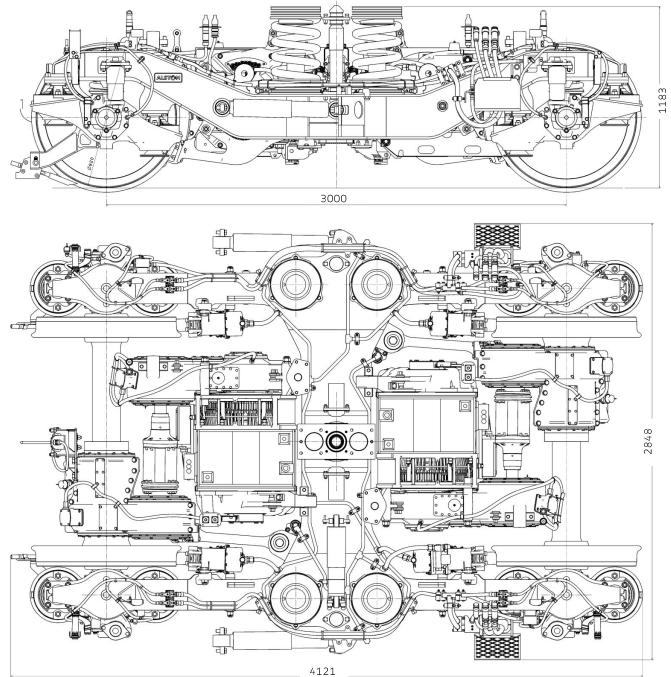
- Motor suspended under carbody
- Active electric tilting system ($\pm 8^\circ$) which enables the train to reach high speed in curves on conventional lines
- Compatible with UK gauge
- More than 1000 bogies operated on West Coast Mainline by Virgin (UK)

**MAIN BOGIE CHARACTERISTICS**

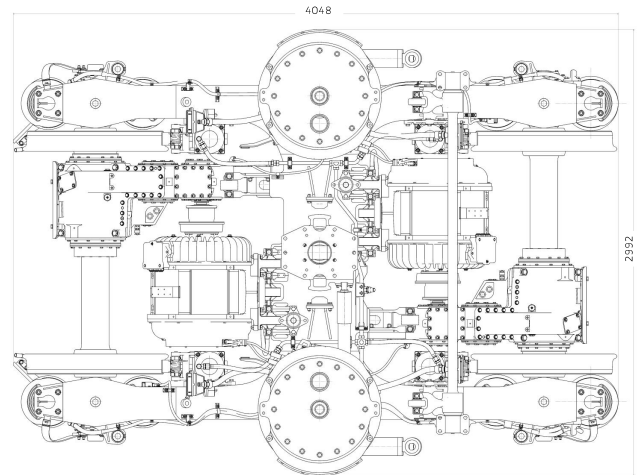
Operating speed (kph)	225
Track gauge (mm)	1435
Bogie type	Conventional
Max axle load (T/a)	17
Weight (T)	Motor bogie : 8.7 / Trailer bogie : 8.5
Tilting (Yes/No)	Yes
Type of primary suspension	Swing arm
Type of secondary suspension	Pneumatic spring
Carbody connection	Roller
Type of brake motor bogie	4 or 5 ventilated axle-mounted discs
Type of brake trailer bogie	6 ventilated axle-mounted discs
Wheel new/worn (mm)	920/860

CL 511**MAIN FEATURES**

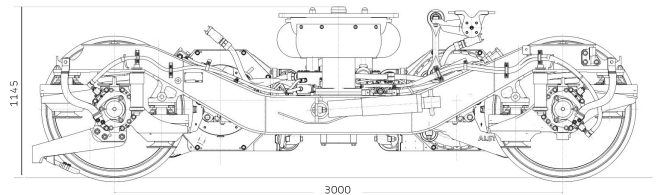
- Concept used on P150 which hit speed record at 574.8 kph in 2007
- Motors suspended under carbody
- Enables concentrated traction
- Enables articulated trainset architecture considered the safest in Very High Speed
- Excellent dynamic behaviour
- REX of nearly 10000 bogies operated by SNCF (FR), Korail (KR) and RENFE (ES). Operation to be started soon by ONCF (MA)

**MAIN BOGIE CHARACTERISTICS**

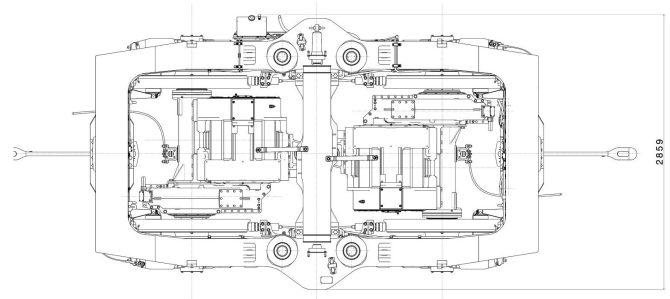
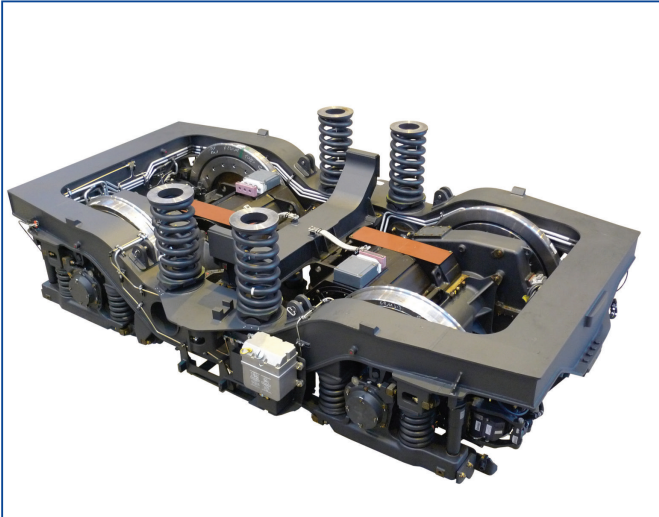
Operating speed (kph)	320
Track gauge (mm)	1435
Bogie type	Conventional and intermediate
Max axle load (T/a)	17
Weight (T)	Motor bogie (with motors) : 11.4 / Trailer bogie : 7.2
Tilting (Yes/No)	No
Type of primary suspension	Motor bogie : guid spring / Trailer bogie : swing arm
Type of secondary suspension	Motor bogie : helicoidal spring / Trailer bogie: pneumatic spring
Carbody connection	Motor bogie : T-link / Trailer bogie : Z-link
Type of brake motor bogie	4 tread brake units
Type of brake trailer bogie	8 axle-mounted discs
Wheel new/worn (mm)	Motor bogie : 920/850 ; Trailer bogie : 910/850

CL 334**MAIN FEATURES**

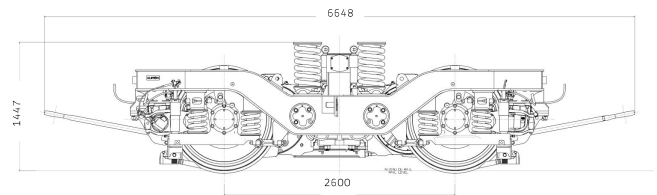
- Concept used on P150 which hit speed record at 574.8 kph in 2007
- Enables articulated trainset architecture considered the safest in Very High Speed
- Optimized distributed traction system thanks to permanent magnet motor
- Light bogie, high level of compacity to ease integration
- 300 bogies operated by NTV (Italy)

**MAIN BOGIE CHARACTERISTICS**

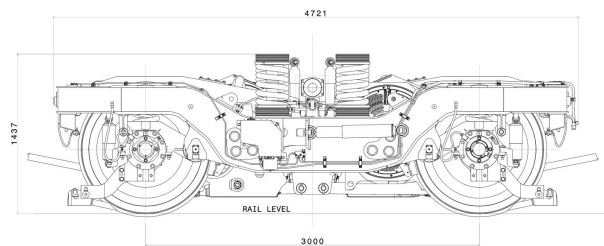
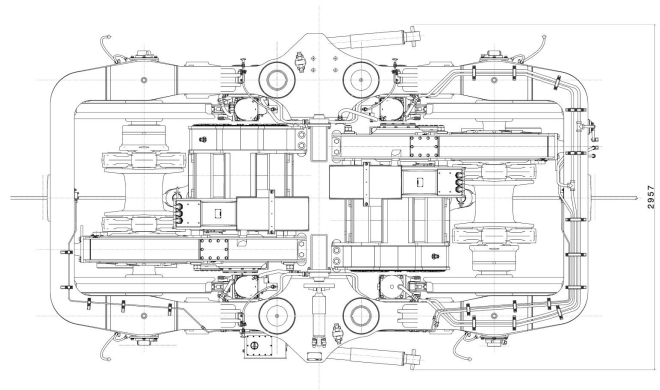
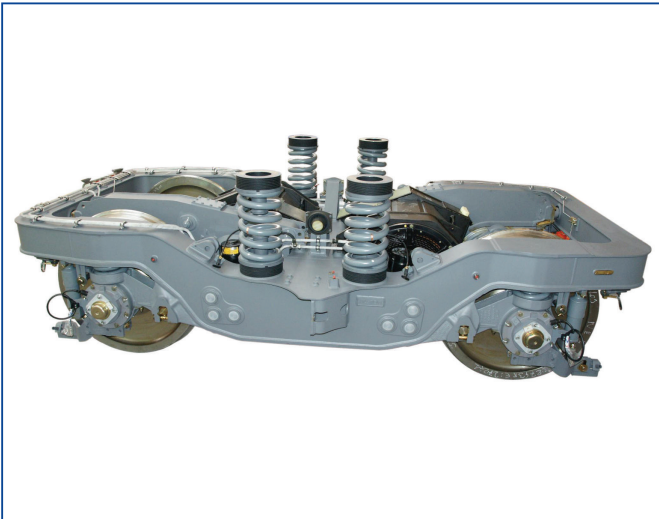
Operating speed (kph)	360
Track gauge (mm)	1435
Bogie type	Conventional and intermediate
Max axle load (T/a)	17
Weight (T)	Motor bogie : 8.3 / Trailer bogie : 6.6
Tilting (Yes/No)	No
Type of primary suspension	Guid spring
Type of secondary suspension	Pneumatic spring
Carbody connection	T link
Type of brake motor bogie	4 tread brake units
Type of brake trailer bogie	6 axle-mounted ventilated discs
Wheel new/worn (mm)	920/850

CL 622**MAIN FEATURES**

- Cannon box transmission
- Important wheel wear capacity (45mm)
- Able to receive all signaling system
- Reliable, strong and easy to maintain
- 1000 bogies operated by SNCF and homologated in France, Germany and Switzerland

**MAIN BOGIE CHARACTERISTICS**

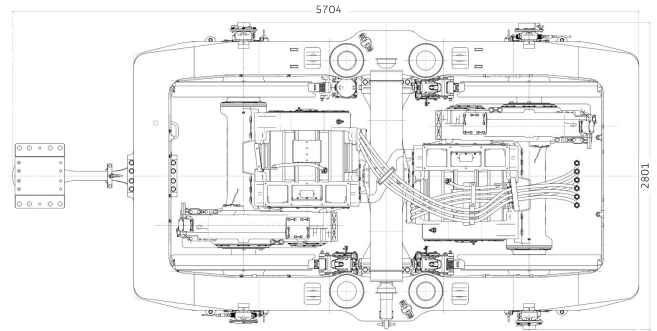
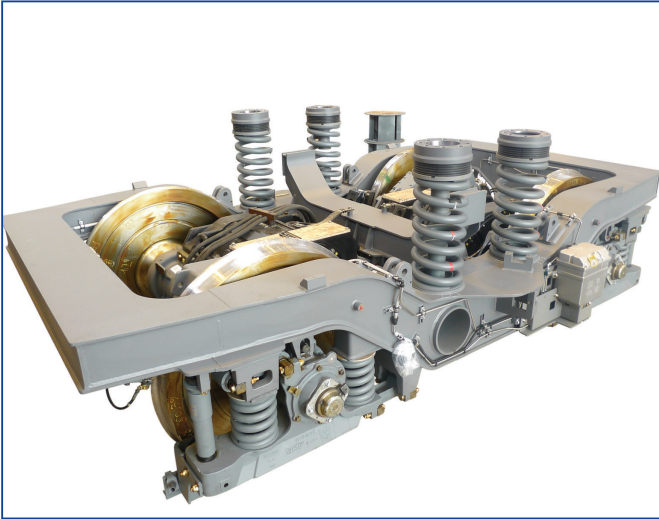
Operating speed (kph)	140
Track gauge (mm)	1435
Bogie type	Bo
Max axle load (T/a)	22.5
Weight (T)	17.1
Tractive effort @ starting (kN)/bogie	175
Type of primary suspension	2 spring groups
Type of secondary suspension	Helicoidal springs
Carbody connection	2 traction bars
Type of brake motor bogie	4 tread brake units or disc brake units
Type of brake trailer bogie	-
Wheel new/worn (mm)	1160/1070

CL 494**MAIN FEATURES**

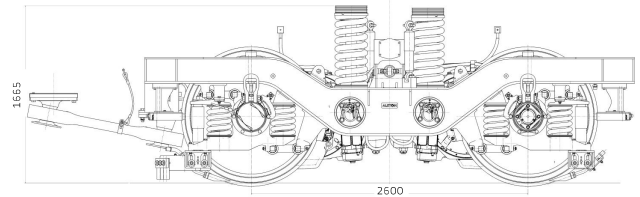
- Fully suspended transmission
- Very good dynamic behaviour at 200 kph
- High traction capability
- Dual service freight and passengers capabilities
- 180 bogies operated by SNCF (FR), SNCB (BE), CFL (LU) and ONCF (MA)

MAIN BOGIE CHARACTERISTICS

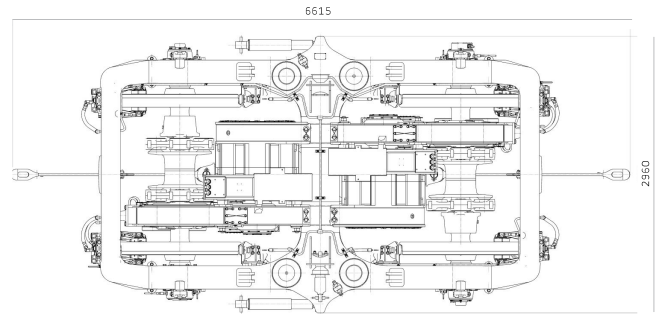
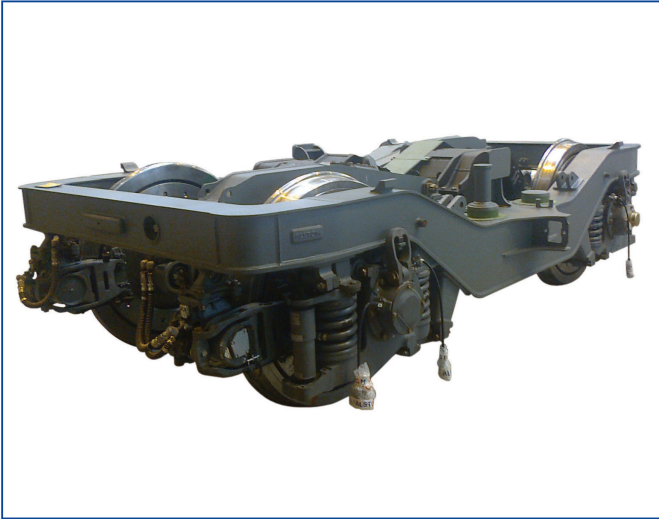
Operating speed (kph)	160-200
Track gauge (mm)	1435
Bogie type	Bo
Max axle load (T/a)	21.5
Weight (T)	18.7
Tractive effort @ starting (kN)/bogie	165
Type of primary suspension	Swing arms
Type of secondary suspension	Helicoidal springs
Carbody connection	2 traction bars
Type of brake motor bogie	4 tread brake units or disc brake units
Type of brake trailer bogie	-
Wheel new/worn (mm)	1160/1080

CL 587**MAIN FEATURES**

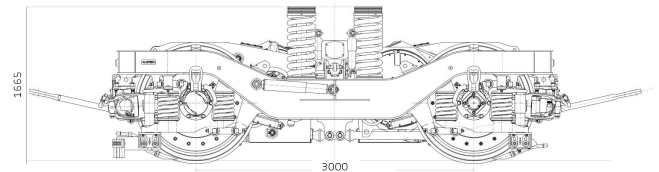
- Cannon box transmission
- Suitable for freight application
- Winterized (-50°C)
- Important wheel wear capacity (50mm)
- GOST or EN standards compliant
- Reliable, strong and easy to maintain bogie operated in Kazakhstan, Russia and China

**MAIN BOGIE CHARACTERISTICS**

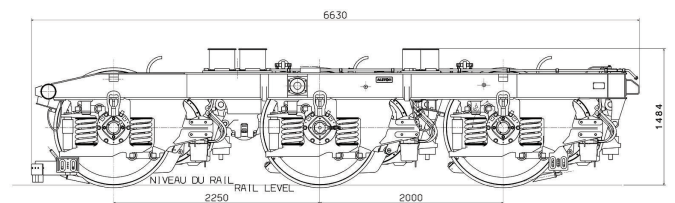
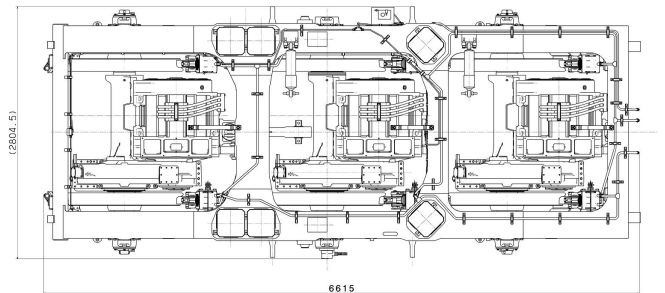
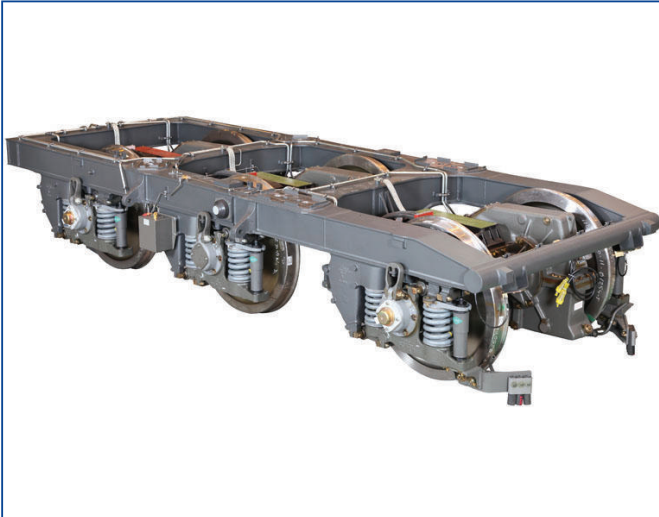
Operating speed (kph)	120
Track gauge (mm)	1435 or 1520
Bogie type	Bo
Max axle load (T/a)	25
Weight (T)	16.9
Tractive effort @ starting (kN)/bogie	208
Type of primary suspension	2 spring groups
Type of secondary suspension	Helicoidal springs
Carbody connection	1 traction bar
Type of brake motor bogie	4 tread brake units
Type of brake trailer bogie	-
Wheel new/worn (mm)	1250/1150

CL 593**MAIN FEATURES**

- Fully suspended transmission
- Very good dynamic behaviour at 200 kph
- Suitable for passenger application
- Winterized (-50°C)
- High traction capability
- Important wheel wear capacity (50mm)
- GOST standards compliant
- Operated in Kazakhstan by KTZ

**MAIN BOGIE CHARACTERISTICS**

Operating speed (kph)	200
Track gauge (mm)	1520
Bogie type	Bo
Max axle load (T/a)	21.5
Weight (T)	18.5
Tractive effort @ starting (kN)/bogie	132
Type of primary suspension	2 spring groups
Type of secondary suspension	Helicoidal springs
Carbody connection	2 traction bars
Type of brake motor bogie	4 disc brake units
Type of brake trailer bogie	-
Wheel new/worn (mm)	1250/1150

CL 465**MAIN FEATURES**

- Cannon box transmission
- Important wheel wear capacity (50mm)
- Reliable, strong and easy to maintain bogies
- One of the world highest traction load capability
- More than 1000 bogies operated by the MOR in China

MAIN BOGIE CHARACTERISTICS

Operating speed (kph)	120
Track gauge (mm)	1435
Bogie type	Co
Max axle load (T/a)	25
Weight (T)	27
Tractive effort @ starting (kN)/bogie	290
Type of primary suspension	2 spring groups
Type of secondary suspension	Rubber elements
Carbody connection	1 traction rod
Type of brake motor bogie	6 tread brake units
Type of brake trailer bogie	-
Wheel new/worn (mm)	1250/1150

Alstom

48 rue Albert Dhalenne
93482 Saint-Ouen
France

traincomponents@alstom.com

www.alstom.com

The ALSTOM logo, featuring the word "ALSTOM" in a bold, blue, sans-serif font. The letter "O" is replaced by a red circle with a white horizontal line through its center.